IHS Best Practice Model
Diabetes and Pregnancy

Why is this important?

Diabetes in pregnancy poses risks for both mother and baby. Careful management of diabetes during pregnancy, including early screening for gestational diabetes, reduces these risks. Consider these facts:

- Diabetes in pregnancy results in greater maternal morbidity and mortality; improved recognition and management results in improved outcomes.
- Uncontrolled gestational diabetes increases the risk for infant macrosomia, hypoglycemia, respiratory distress, orthopedic injuries secondary to increased birthweight, hypocalcemia, jaundice, and late miscarriage. When diabetes predates the pregnancy, elevated blood sugar, especially during the first trimester, is associated with an increased incidence of congenital malformations and pregnancy loss.
- Women who have had gestational diabetes have a higher risk for developing type 2 diabetes any time after the pregnancy.
- Diabetes confers an additional long-term risk in the offspring for elevated body mass index (BMI), early-onset type 2 diabetes or impaired glucose homeostasis and the attending risk of complications of those conditions.
- The increase in BMI and insulin resistant conditions results in an ever spiraling increase in risk for more gestational and pregestational diabetes and the associated adverse outcomes.
- There is good evidence that maternal euglycemia improves perinatal outcome, eliminating the risk of developing conditions cited above. Euglycemia may help prevent the long-term risk of developing diabetes for the offspring; however, no good outcome data presently exist to support this assumption.
- Good glycemic control in the 2nd and 3rd trimester has been shown to improve neonatal outcomes for type 1 patients during pregnancy *(Diabetes Care, Vol. 23, No. 10, 1494-98, Oct. 2000).* This study showed that even small excursions out of the normal blood glucose range significantly increased morbidity; only those with mean overall blood glucose of 95 or less had outcomes similar to nondiabetic controls. Blood glucose testing seven times daily may be necessary to achieve these results.
- Multidisciplinary intervention with intensive education, management by trained practitioners, and community involvement has a beneficial effect on outcome. These should form the foundation for any management program.
- Certain pre-existing conditions such as polycystic ovary syndrome (PCOS), elevated BMI, acanthosis nigricans (AN), or ethnicity may help

to identify woman at risk for developing diabetes during pregnancy. These should be addressed prior to pregnancy in the context of healthful living and possibly medication.

What measures are used?

- Studies in the Pima Indians show that 15 percent of children age 10 to 14 years exposed to diabetes in utero have the disease; the prevalence of diabetes increases to 25 percent in those 15 to 19 years of age.

- The Healthy People 2010 Objective is to decrease the proportion of women with gestational diabetes.

What are the components of quality care in screening for and managing pregnancies complicated by diabetes?

- It is important to establish whether a mother has DM during her pregnancy, Methods for accomplishing this may vary by clinic, resources, and population.
- Universal Case Identification is recommended. With this approach, all pregnant women are screened for diabetes. The ADA recognizes two acceptable approaches:
- Fasting 2-hour 75 gm test without initial screen; positive if 2 of 3 values abnormal.
- 1-hour 50 gm glucose challenge screen: a positive 1 hour 50 gram screen (in fasting or fed state) is variably defined as 130, 135, or 140mg/dl. The lower threshold value identifies more cases of gestational DM, which we would expect to be common in high-risk populations. 100 gm, fasting, 3 hour glucose test on patients with positive challenge screen; positive if 2 of the 4 values are abnormal. One abnormal or multiple "borderline" values are associated with risks; additional intervention may be indicated. Guidelines are helpful, but good clinical interpretation and judgment are needed. Timing of screen: 24-28 weeks; high-risk patients should be screened upon diagnosis of pregnancy. Retesting of high risk patients with normal results at some point later in the pregnancy may be indicated.

- Management: Present evidence dictates that attempts should be made to attain euglycemia, which benefits mother and child. Long-term outcomes for the offspring are also improved. *(Medical Management of Pregnancy Complicated by Diabetes, third edition)*
    - Goals: optimal maternal and fetal outcomes occur when maternal blood sugar is maintained within the following ranges: (*Medical*

Mangement of Pregnancy Complicated by GDM, *third edition, ADA: page 52)*

- Program
  - Education: extensive continuous education is required for optimal results. This should include the following:
    - Explanation of disease process
    - Role of diet
    - Role of exercise
    - Self blood glucose monitoring
    - Impact of psycho-social issues
    - Behavioral modification
    - Economic considerations
    - Medication use
  - Multi-disciplinary team: GDM requires considerable time and effort on the part of the patient (as well as their family and the diabetes team members). We must make every effort to integrate community and clinical support services in managing diabetes in pregnancy.
  - Continued impact on family after delivery

Best practice models appropriate for AI/AN communities:

- Claremore, OK GDM Program
- Gila River Health Care Corporation DM and Pregnancy Program, Sacaton, AZ
- Albuquerque, NM DM Program
- Chickasaw Nation Health System GDM Program (ADA, OK)
- Trinidad, CA SDM (Staged Diabetes Management) for GDM

What level of care should your program offer?

Basic level

- Goal: Identify women with or at risk of developing GDM (with ultimate goal of intervening to prevent known associated complications)
- Objectives:
- Develop registry of Women of Childbearing age
- Consider sub-directory of high-risk women, e.g. obese, irregular menses/PCO, previous GDM, FHx DM or GDM
- Develop community-based guidelines for screening
- Develop community-based guidelines for referrals
- Provide community and provider training

- Conduct focus-groups for women of child-bearing age and providers.

Intermediate level:

- Goal: Improve services offered to women to achieve healthy outcomes of pregnancy; focus on women identified by program described above in Basic level
    - Objectives:
    - Identify multi-disciplinary team members
    - Develop and implement basic education and management program
    - Monitoring
    - Nutrition
    - Exercise
    - Establish guidelines for referral
    - Community intervention, i.e. PHN (Public Health Nursing), WIC
    - Medical management, i.e. laboratory studies, medications, medical follow-up

Comprehensive level:

- Goal: Provide complete diagnostic and management services for all variables to achieve healthy outcomes of pregnancy
- Objectives:
- Develop and implement a comprehensive education program for diabetes in pregnancy, i.e. curriculum
- Provide full management program
    - Guidelines for care
    - Staff
    - Laboratory personnel and testing capabilities
    - Refer to high risk perinatal programs if needed
        - Provide ongoing staff training;
        - Develop a program for post-partum follow-up for mom and babies;
        - Develop a pre-pregnancy counseling program; identify conditions such as PCO, AN, anovulation/infertility which are associated with insulin resistance;
        - Develop data tracking and analysis program; publish or present outcomes on a regular basis.

Who are your target populations?

- All females of child-bearing age presenting to IHS facility
- Teenagers with IGT (Impaired Glucose Tolerance), DM, obesity, AN, PCO who have reached puberty

Assessing the effectiveness of your program—how and what elements should you measure to evaluate the success of your program?

Methods of assessment:

- Focus groups;
- Knowledge surveys;
- Yearly satisfaction surveys;
- RPMS data/ diabetes audit;
- Determine number of persons at risk;
- Assess number and qualifications of community and medical personnel vis a vis providing appropriate GDM management.

Minimum data elements:

- Number of teens at puberty/women of child-bearing age with: DM, IGT, obesity, AN, PCO, F Hx ;
- HbA1c (Glycosylated hemoglobin), fructosamines; in at risk populations: c-peptides;
- Attendance at classes, clinic visits, compliance with glucose testing instructions, compliance with diet/exercise prescriptions, appropriate referrals;
- Birth weights;
- Maternal weight gain;
- Pre-pregnancy counseling (had vs. did not have);
- Complications: miscarriages, malformations, small for gestational age, large for gestational age, increased bili, hypoglycemia, respiratory distress, apnea;
- Post-partum follow-up for moms: attendance at clinic visits, glucoses (to determine if diabetes is resolved at delivery or persisted after);
- Screened at appropriate times;
- BMI, glucose tolerance information on children born of a pregnancy complicated by diabetes.

Program progress indicators (values measured above should reflect progress of program):

- Have all charts been audited or reviewed?
- HbA1c: 4-6% ideal; max 6.5; fructosamine: wnl; c-peptides:wnl;
- Number of classes completed and clinic visits: goal 100 percent; number of times tested vs. number of times should have been tested; carbohydrates

consumed vs. carbohydrates prescribed; exercise log completed; exercise prescription followed; tracking of referrals.

- Infant birth weight less than 9 lbs.
- Maternal weight gain: at national average.
- Pre-pregnancy counseling: goal 50 percent.
- Miscarriages: goal 0 percent; malformations: goal 0 percent; babies should have appropriate weight for gestional age; nl bili; nl gluc; no apnea; no respiratory distress.
- Attendance at follow-up visits: goal 100 percent
- Screened: goal 100 percent targeted group
- Normal weight, normal glucose tolerance in children born of pregnancy complicated by diabetes: goal 100 percent.

What issues should you consider in preparing your program proposal?

- Does your proposal demonstrate your capabilities (personnel, money, data-collection and analysis capability, space) to implement the activities you propose?
- Are your objectives measurable?
- Is your proposal realistic in terms of what you want to achieve?
- Have you shown that there is an important problem and that the intervention (as described in your grant application) will make a difference?
- Is your proposal supported by sound scientific reasoning?
- Will your program help to reduce the burden of diabetes-in-pregnancy-associated problems?
- Does your proposal incorporate community-based resources?
- Have you sought input from your community?
- Will your community understand the reason for implementing the proposed programs and will it be kept up-to-date on the program's progress?

Lessons learned in American Indian/Alaskan Native communities:

- **Pima:**
  - *Congenital Susceptibility to NIDDM Pettitt, et al., Diabetes vol.37, May 1988*
  - *Diabetes and Obesity in the Offspring of Pima Indian Women With DM during Pregnancy Pettitt, et al.,*
  - *Diabetes Care vol. 16, suppl. 1, Jan 1993*
  - *Am J Med vol 97, 1994*
- **Navajo**, Sugarman in late 1980's
- **Zuni in 1980's**